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EFFECTIVENESS OF KILL-TYPE TRAPS VERSUS LEG-HOLD TRAPS UTILIZING DIRT-HOLE SETS

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Abstract: An evaluation was conducted to compare the effectiveness and humaneness of kill-type traps versus leg-hold traps for land sets. Data were obtained for 448 trap nights which resulted in the capture of 49 animals in leg-holds and 14 in conibears. The leg-hold trap demonstrated a significantly higher capture rate for total animals ($P < 0.01$), opossum (*Didelphis marsupialis*) ($P < 0.01$), and raccoons (*Procyon lotor*) ($P < 0.05$). Conibears generally did not kill captured animals instantly and only 64.3% of the animals were captured by the neck or head.

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During the last decade, trapping in North America has evoked considerable criticism from various groups because of the inhumane aspect of capturing animals with traps. The primary target of this criticism has been the leg-hold traps. The responsibility of wildlife managers is to continually monitor different trapping methods and determine which are the most effective and humane. The suggestion that kill-type traps could be substituted for leg-hold traps as a more humane method of capturing furbearers has prompted this study to determine both effectiveness and humaneness of the respective traps for land sets.

Several studies have been conducted in marsh areas comparing trapping success of conibears and leg-hold traps. Linscombe (1976) reported that the 220 conibear cannot be used as a more efficient replacement for the standard leg-hold trap in coastal Louisiana. Palmisano and Dupie (1975) reported that the leg-hold caught significantly more nutria *(Myocastor coypus)* than the single spring 220 conibear. They also noted that the conibear was superior to the leg-hold in capturing muskrat *(Ondatra zibethica)* in flooded marshes. Studies conducted in Canada by Shannon and Novak (1972) indicated that the conibear was an efficient trap for aquatic furbearers and in specialized tree sets for raccoons. Berchielli and Tullar (1980) compared leg snares with leg-hold traps on terrestrial furbearers in New York. Their conclusions were that the Exyonem leg snare was less effective than the No. 1½ double coil spring leg-gripping trap for capturing red foxes *(Vulpes fulva)*, gray foxes *(Urocyon cinereoargenteus)*, raccoons and opossums.

At present, no effective alternative method has been developed to replace the leg-hold trap for capturing terrestrial furbearers, particularly foxes and bobcats *(Lynx rufus)*.

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METHODS

The study was conducted in East Central Georgia in the Piedmont and Upper Coastal Plain physiographic regions. Six study areas were selected on the basis of having 12.9 km (8.0 mi) of suitable roads with little human disturbance. Traps utilized were standard commercial Victor conibear #220 double spring and Blake and Lamb #2 leg-hold traps. These were alternated at 0.32-km (0.2-mi) intervals along woods roads on the study areas. This standardized method for selecting trap sites was employed to provide an equal opportunity for each trap to be visited. Time intervals and trap spacing used in this study were adapted from Wood (1959). The leg-hold traps were set using the standard dirt-hole set with the bait hole dug at a 30 degree angle and measuring approximately 15.24 cm (6 in) deep and 5. 08 cm (2 in) wide. The excavation for the trap was made just large enough to accommodate the trap which was located directly in front of the bait hole. A strip of unscented toilet paper was used as a pan cover and the entire trap was then covered with sifted peat moss to prevent freezing. Sifted dirt from the vicinity of the set was used when the ground was not frozen. When set, the pan was located approximately 10.16 cm (4 in) from the bait hole and slightly below ground level.

The same principle was used for setting the conibears. An area was excavated the size of the conibear and the trap was placed flat on the ground with the wire trigger turned upward and the prongs separated about 2.2 cm (1 in). The trap was then covered with peat moss or dirt, and a bait hole was very delicately placed inside the corner of the trap jaw. The trigger was approximately 10.16 cm (4 in) from the bait hole. Sticks were placed to guide the animal into the trigger. The trap was tripped by the animal stepping on the wire trigger. Traps set in this manner usually jump straight up, capturing the animal by the head or neck. Drags used on all sets were approximately 10.16 cm (4 in) diameter shrubs wired to the chain. The chains and wire were covered with dirt. Red fox urine and pork cracklings were utilized as baits and scents.

All sets were made by the author. Traps were checked and reset each morning. Attempts were made to set 20 conibears and 20 leg-holds in 1 day and run them for 3 consecutive days. This routine was broken on 4 occasions for various reasons. In 1977, 17 of each type trap were set and rained out after 1 trap night at Clark Hill (Table 1). Milhaven Line-B was rained out after 2 days. On Ogeechee, the 1st day, only 11 traps of each were set and the remaining 9 traps were set the following day and checked for 3 successive days. In 1978, Milhaven Line-B was rained out after 1 night.

Design of the study allowed statistical analysis for paired observations for the 2 trap types. Instances when no animals were captured by either type trap were treated as a missing observation and ignored in processing.

RESULTS

A total of 448 trap nights for each type trap resulted in the capture of 3 bobcats, 12 gray foxes, 2 red foxes, 3 spotted skunks *(Spilogale putorius)*, 7 feral dogs *(Canis familiaris)*, 8 raccoons, 1 fox squirrel *(Sciurus niger)*, and 1 feral cat *(Felis catus)*. Bobcats, red foxes, skunks, rabbits, a fox squirrel and a feral cat

Table 1. Trapping Data by Study Area, Dates and Species Captured.

Date	Area	Gray Fox		Opossum		Dog		Raccoon		Bobcat		Red Fox	
		#2	#220	#2	#220	#2	#220	#2	#220	#2	#220	#2	#220
12/14/77	Clark Hill	1	1							1			
12/20-23/77	Ogeechee	1	1	2		2		1		2		1	
1/10-12/78	Bussy Point	1	1										
1/17-19/78	Milhaven Line-A			6	3								
1/23-24/78	Milhaven Line-B		2	3								1	
12/6-8/78	Clark Hill	2		3		1		2					
12/19-21/78	Ogeechee	1	1	1		1	3	2					
1/17-19/79	Milhaven Line-A			2	1			1	1				
1/23/79	Milhaven Line-B			1				1					
Total		6	6	18	4	4	3	7	1	3		2	

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Table 2

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Opossu
Rabbit
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Racoon
Squirrel
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were captured only by the leg-hold traps. The remaining animals were captured by both type traps. Forty-nine animals were captured in leg-hold traps as compared to 14 in conibears (Table 1).

The mean difference for total animals trapped and each species captured was positive (except gray fox) (Table 2). Since the number of animals of all species (except gray fox) trapped with the #2 coil spring consistently exceeded those trapped with the #220 conibear, the coil trap appears to be a more effective method of capturing terrestrial furbearers.

Table 2. Values Are Differences Between Animals Caught In #2 Versus Those Caught in #220. Data Restricted To Days In Which At Least 1 Animal Was Caught.

Variable	N Missing	N	Mean Difference	Std. Error of Mean
All Species	1	22	1.59	0.32
Bobcat	20	3	1.00	0.00
Gray Fox	13	10	0.00	0.36
Red Fox	21	2	1.00	0.00
Skunk	20	3	1.00	0.00
Opossum	10	13	1.07	0.26
Rabbit	20	3	1.33	0.33
Feral Dog	18	5	0.20	0.49
Raccoon	15	8	0.75	0.25
Squirrel	22	1	1.00	
Feral Cat	22	1	1.00	

Paired t-tests indicated a statistically significant difference between the average number of total animals ($P < 0.01$), opossum ($P < 0.01$), and raccoon ($P < 0.01$) captured by the #2 Blake and Lamb traps and the average of those species captured by the #220 conibear traps (Table 2). There was no significant difference ($P < 0.01$) for gray fox, rabbit, and feral dog. Sample sizes for bobcat, red fox, skunk, fox squirrel and feral cat were too small to provide a reasonable basis for testing.

With conibear traps, only 1 of the 14 animals captured, a feral dog, was presumably killed instantly. The wire, which was attached to the drag, was still covered except at the very corner of the trap. The drag was not disturbed and there was no sign of a struggle. The trap hit the animal across the skull and apparently killed it instantly.

Two dogs, 1 raccoon and 2 opossums were captured by the leg with the conibear. All other animals were captured by the head or neck. This resulted in 64.3% of the animals captured by the neck or head and 35.7% captured by the leg. All 6 gray fox were captured by the neck or head with the conibear.

Seven animals (50%) were found alive in the conibears. Five of these were captured by the leg. The others captured by conibears showed signs of a struggle before death by moving the drag from a few feet up to 36.5 m (120 ft) from the original set.

DISCUSSION

Although the number of observations for testing trap effectiveness is small, one can conclude that a greater number of total animals, opossum and raccoons, will be caught on the average using the #2 leg-hold traps rather than #220 conibear traps. This study indicates the traps were equally effective in capturing gray fox which might be misleading. More observations are needed to draw any conclusions on gray fox and the other species.

I experimented with several techniques of setting conibear traps for terrestrial furbearers. The technique utilized in this study was selected because of ease in camouflaging the trap. In my opinion, this technique would be more effective for capturing terrestrial furbearers than the cubbyhole type sets often used with conibear traps. However, more research is needed in comparing the 2 techniques.

It is difficult to explain why this study resulted in a significantly greater capture rate of animals in leg-hold traps versus conibears. In my opinion, 1 reason was that the size area of disturbed ground required for covering the conibear caused suspicion. Also, portions of the conibear traps were exposed more readily than leg-holds under windy conditions due to the larger area covered and the light weight of the peat moss.

Other disadvantages of the #220 conibear trap for land sets include: higher trap cost, inability to release non-target animals, and time required in setting traps. Linscombe (1976) found that the #220 conibear could not be used efficiently in floating marsh, did not allow the common practice of releasing undersize nutria, and captured more non-target animals in brackish marsh than the #2 Victor. This study indicated that the #220 conibear is not as effective as the leg-hold for capturing terrestrial furbearers utilizing a dirt hole type set.

The conibear trap certainly did not prove to be an instant kill trap for land sets. Only 7.1% of the animals captured were killed instantly. Most animals found dead in the traps obviously struggled and apparently suffocated.

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